Avinashilingam Institute for Home Science and Higher Education for Women

(Deemed to be University under Category 'A' by MHRD, Estd. u/s 3 of UGC Act 1956)
Re-accredited with 'A+' Grade by NAAC. Recognised by UGC Under Section 12B
Coimbatore - 641 043, Tamil Nadu, India

Master's Degree Examination – June / July 2021
II Semester

Class: I PG **Time : 3 Hours**
Major: Biochemistry **Max Marks : 100**

20MBCC08 Genetics and Molecular Biology
Part A **10 x 1 =10**
Choose the Correct Answer

1. If both genotype and phenotype shows the same ratios of 1:2:1 in the F_2 generation, it shows CO1K2
   a. incomplete dominance in monohybrid cross b. co-dominance
   c. complete dominance in monohybrid cross d. dihybrid cross

2. Lack of independent assortment of two genes is due to CO1K1
   a. recombination b. crossing over c. linkage d. repulsion

3. Which of the following conditions are required for a population to be in Hardy-Weinberg equilibrium? CO2K2
   a. Large population
   b. No mutations
   c. No gene flow between populations
   d. All of these are conditions of Hardy-Weinberg equilibrium

4. The giant chromosome with a number of chromonemeta is_____. CO3K1
   a. Hetrochromosome b. Polytene chromosome
   c. Lampbrush chromosome d. Supernumerary chromosome

5. In prokaryotes, DNA replication begins at a single site that is rich in AT nucleotide sequence, where two strands unwind and separate. This ATP dependent process catalyzed by a protein CO3K3
   a. DnaA protein b. Single strand binding protein
   c. DNA polymerase d. Topoisomerase

6. In eukaryotes, which of the following DNA polymerase is required for mitochondrial DNA replication? CO4K1
   a. Pol alpha b. Pol beta c. Pol gamma d. Pol delta

7. Which of these subunits of RNA polymerase is totally required to initiate transcription?
   a. alpha (α) b. sigma (σ) c. omega (ω) d. beta (β)

8. In eukaryotes, in order to initiate transcription CO4K3
   a. RNA strand must be present b. RNA polymerase must be present
   c. Core promoter sequence must be present d. None of the above.

9. The genetic code translated the language of _____ CO4K1
   a. Proteins into that of RNA b. Amino acids into that of RNA
   c. RNA into that of proteins d.RNA into that of DNA

10. The eukaryotic initiation codon recognizes_____ CO5K2
   a. f-Met-tRNA-f-Met b. Met-tRNAi-Met
   c. f-Met-tRNAi-Met d. f-Met-tRNA-Met

Part - B **5 x 6 = 30**

Answer ALL questions

Each answer should not exceed 400 words or two pages

11.a. Explain chromosomal theory of inheritance. CO1K3

(or)

11.b. Review on the Lifecycle of Fungi. CO1K2

12.a. Write a note on Hardy Weinberg Law. CO2K3

(or)

12.b. Explain the Structure of Chromosome. CO2K3

13.a. Examine the role of RNA polymerase and Pribnow box in transcription. CO3K3

(or)

13.b. Describe Central dogma of Molecular Biology. CO4K3

14.a. Classify and summarize the role of Different DNA polymerases in Eukaryotes. CO3K2

(or)

14.b. Explain the reverse transcription. CO4K3

15.a. Tabulate genetic code. CO5K1

(or)

15.b. Review the DNA Methylation. CO5K2

Part - C **5 x 12 = 60**

Answer ALL questions

Each answer should not exceed 800 words or four pages

16.a. Describe Linkage, crossing over and Chromosome mapping in *Drosphila melanogaster.* CO1K2

(or)

16.b. Discuss on Oogenesis and Spermatogenesis. CO1K2

17.a. Elaborate on genetic variation at Molecular Level. CO2K3

(or)

17.b. Explain Legal and Ethical issues in genetics. CO2K3

18.a. Summarize the process of DNA Replication in Prokaryotes. CO3K5

(or)

18.b. Explain the DNA Damage and DNA Repair Mechanisms. CO3K3

19.a. Illustrate the mechanism of transcription in prokaryotes. CO4K2

(or)

19.b. Discuss on capping and tailing of post transcriptional modification of mRNA. CO4K2

20.a. Explain how genetic code is deciphered. CO5K3

(or)

20.b. How the gene expression is regulated by lac and trp Operons. CO5K2

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